Making Industries Smarter

The Next Generation of Photoelectronic Sensors
“Sensors are the most important components of smart machines.”

Dr. Alexander Ohl
Development Director, wenglor sensoric
Photoelectronic Next Generation stands for a new age of smart photoelectronic sensors. Wenglor’s portfolio provides a unique combination of the communication and performance capabilities which are required to make machines smart in the first place. As thinking, networked, learning sense organs, PNG//smart sensors are an integral constituent of automated production and logistics processes.

"Sensors are the most important components of smart machines."
PNG//smart sensors are the result of a unique combination consisting of an intelligent interface and precision wenglor technology. They flexibly exchange process and parameters data and, thanks to accurately targeted optics and a balanced switching point, they transmit highly precise results in real-time.
The position of the spot varies in the case of sensors without targeted optics. Acquired data vary as well in the case of non-balanced switching points. Consequently, data communicated from different sensors are not comparable.

In the case of targeted optics and balanced switching points, data obtained from the different sensors are comparable.
Communication

Speaking and Understanding the Language of Industry

Digital production of the future is already possible today with PNG//smart sensors. Equipped with the latest IO-Link version, the intelligent sensors permit highly flexible production and, at the same time, increase efficiency – by means of quick initial start-up, reduced idle time and consistent quality assurance.
Manufacturing Lot Size 1
Ongoing production processes can be flexibly switched over to another product with the help of PNG//smart sensors. Costly setup time is eliminated for batch changes. This results from the sensors’ capability to exchange information with each other, as well as with actuators. The respective data are conditioned and processed by the sensors. This permits networked communication from machine to machine, by means of which the entire value chain can be optimized.

Predictive Maintenance
The sensors generate and transmit additional diagnostics and status data (condition monitoring). Analysis of this data makes it possible to plan maintenance work in advance and avoid downtime in production.
Simple Configuration
wenglor wTeach2 software is available free of charge and assures easy handling when configuring sensors – including evaluation and visualization of measurement and diagnostics data.

Integration into Existing Systems
PNG//smart sensors communicate with all common control systems via the IO-Link interface and can thus be easily integrated into existing networks.

Wireless Presettings via NFC
PNG//smart sensors can even be configured in the de-energized state before installation – simply, while on-the-go using a smart phone or a tablet with the wenglor app.
Quick Initial Start-Up
Set up once – duplicate as often as you’d like. The PNG//smart sensor configuration can be stored to the controller and transferred to other applications by simply clicking a button, regardless of your current location.

Plug & Play with Data Storage
If a sensor is replaced, stored parameters are transferred automatically to the new sensor making replacement possible without programming.

wenglor offers intelligent communication via IO-Link in other product categories as well:
Performance

Innovative wenglor Technologies for Maximum Precision

wenglor’s latest ASIC\(^1\) development and precisely targeted optics provide for maximum precision and reliability of each individual PNG//smart sensor. Sensors with this technology perform better than ever before.

\(^1\) ASIC = Application-Specific Integrated Circuit
Installation Without Mounting System

Optics targeted at the factory and the balanced switching point assure that PNG//smart sensors with identical settings always deliver exactly the same results. This means that they can be secured in matching fixtures without a complex mounting system. This not only saves time and money during initial start-up, it also results in additional flexibility for the integration of sensors into the existing design of the respective equipment or an automated vehicle system. In combination with data storage, PNG//smart sensors also offer the world’s first plug & play solution which doesn’t require any reprogramming or readjustment.
Flexible Switching or Measurement
Switching statuses or distance values can be read out via the IO-Link interface. Flexible setting options reduce type diversity within the respective systems and minimize inventory costs.

Reliable Object Detection
Whether black, glossy or transparent: PNG//smart sensors detect objects regardless of their color, shape or surface structure.

Insensitive to Interference
The sensors are insensitive to interference such as ambient light or electromagnetic influences thanks to specially developed processes.
Safety Thanks to Laser Class 1
PNG//smart generation laser sensors are entirely safe for the human eye. As a result, they can be used on moving fixtures such as robot arms and shuttles. Warnings and complex protective measures are unnecessary.

No Reciprocal Influence Thanks to WinTec
PNG//smart sensors don’t influence each other when they’re mounted directly next to or opposite each other. This makes a great number of queries possible in very tight spaces.

WinTec
Inspiring Contactless Object Detection

Industry is inspired by the great variety of functions provided by the PNG//smart series – with an ideal solution for every application. Seven optical functional principles based on various light sources result in the largest possible selection of sensors for Industry 4.0.

- Long-Range Laser Distance Sensors
- Energetic Reflex Sensors
- Reflex Sensors with Background Suppression
- Universal Retro-Reflex Sensors
- Retro-Reflex Sensors for Transparent Objects
- Through-Beam Sensors
- Reflex Light Barriers
Automotive Industry
A smooth flow of materials is of decisive significance for trouble-free production. Reflex sensors with background suppression monitor material supplies for this reason, for example in automobile manufacturing.

Packaging Industry
Reflex sensors with background suppression and blue light are especially well-suited for the detection of dark or glossy packages.
Beverages Industry
Retro-reflex sensors for transparent objects reliably detect transparent objects such as trays or PET and glass bottles with the help of a reflector. The sensors are equipped with an intelligent function for dynamic readjustment of the switching threshold in order to ensure precise object detection in the long-term. They automatically adjust the switching threshold in the event of contamination, aging or temperature fluctuation. Thanks to their single-lens optics without blind spot, retro-reflex sensors for clear glass recognition are capable of detecting objects through small openings such as drill holes or gaps.

Woodworking Industry
Highly strict demands are placed on photoelectronic sensors in the woodworking industry due to the dusty working environment. Thanks to heightened light intensity, wenglor’s through-beam sensors are perfectly reliable even in adverse environments. Additional diagnostics and status data from the condition monitoring function, as well as a contamination warning, make the sensors ideal for use under the conditions which prevail in the woodworking industry.
**Logistics**

In Logistics 4.0, unmanned transport systems such as forklifts and shuttles are used to transport goods through logistics centers. Thanks to their compact housings, long-range laser distance sensors can be easily integrated into the vehicles in order to guide them through their environment without colliding and safely load or unload materials. With switching distances of up to 3000 mm and unparalleled performance where the detection of black and glossy objects is concerned, PNG//smart sensors are first choice for intralogistics experts.

**Electronics Industry**

Due to their stamped or perforated surfaces, PCBs are difficult to detect. wenglor has developed a reflex sensor especially for this application which features a spot in the form of a line which accurately detects PCBs. Notches, holes or components on the PCBs don’t disturb the sensor. The reflex sensor can also be used to reliably detect objects whose position on the conveyor belt varies.
Packaging Industry

Reflex light barriers detect even transparent packages which are located between the barrier and a specified background without the help of reflectors. This eliminates costs associated with mounting systems and reflectors, and offers additional installation flexibility. Reflex light barriers can be used throughout the entire packaging process – from monitoring the flow of materials in filling systems right on up to checking for the presence of packages.
“The ingenuity of the housing format is its simple design.”

A wenglor-Sensor of the PNG//smart generation is distinguished by that of which it has less. Fewer parts, less weight and fewer different housing materials – a product design which makes use and initial start-up of the entire product range smart.
PNG//smart Housing Formats

Rugged plastic or stainless steel housing with IP67/IP68/IP69K

Expanded temperature range of −40 to +60°C

Robust, easy to clean PMMA disc

Status indicators visible around the entire 360° spectrum

High-performance optics for best performance

Precisely targeted optics

Potentiometer or teach-in key for ideal settings

Housing made of special plastic or stainless steel with molded-on plug for best possible sealing and resistance to mechanical stress

Ultramodern wenglor ASIC technology with integrated IO-Link 1.1

Innovative lightweight design for applications on robot arms and unmanned transport systems

Efficient power consumption conserves resources
Miniature design: 32 × 16 × 12 mm

Switching distance adjustment via IO-Link

Innovative lightweight design | 4 g

With WinTec technology der winTec.

Diverse connection options

Background suppression with large detection ranges of up to 300 mm

With potentiometer or teach-in

2 mutually independent switching outputs
Protective housing for adverse environments

Innovative display unit for simple alignment and accurate diagnosis

Switching distance adjustment via IO-Link

With potentiometer or teach-in

Large ranges of up to 60 m

2 mutually independent switching outputs

Compact housing 75 × 32.5 × 18 mm

Background suppression with visible red light and large detection ranges of up to 1.2 m

Printed QR code for quick access to product information

Reliable configuration via NFC – even in the de-energized state

NFC

IO-Link

1N
Protective housing for adverse environments

With WinTec technology der wintec.

Switching distance adjustment via IO-Link

Compact housing 50 × 50 × 20 mm

Background suppression with visible red light and large detection ranges of up to 1 m

2 mutually independent switching outputs

Unparalleled performance for the detection of black objects

With potentiometer or teach-in

Large ranges of up to 20 m

Innovative display unit for simple alignment and accurate diagnosis

NFC

Reliable configuration via NFC – even in the de-energized state

Printed QR code for quick access to product information
Robust stainless steel 316L housing for harsh and cleaning-intensive environments

Non-destructive and captive laser labeling for permanent visibility

Completely visible LEDs

Resistant to coolants and lubricants with ECOLAB approval

ECOLAB

Resistant to cleaning agents with ECOLAB approval

Flexible mounting with elongated hole (25.4 - 26.8 mm)

IP69K degree of protection

3-pin/4-pin connection variants

Miniature design 35.5 x 18.5 x 17 mm

With potentiometer or teach-in
Detection of Biscuit Cookies
In the production of biscuit cookies, the objects must be transported and gripped between different processes on multi-lane conveyor belts. Thanks to the stainless steel 316L housing, the sensors are ideal for demanding cleaning processes at high temperatures.

Position Sensing of Material on Lathes
In CNC lathes, raw material is secured in clamping devices before the machining process begins. The robust stainless steel 316L housing (degree of protection IP69K) is resistant to aggressive coolants, lubricants or metal shavings generated during the turning process.

Leading Edge Detection of Soft Cheese
In the production of soft cheese, the wedge-shaped pieces of cheese are transported to the packing station on conveyor belts. Thanks to the robust stainless steel housing that is resistant to cleaning agents and has IP69K degree of protection, even high-pressure cleaning at up to 80 °C is possible.
Functional Principle

- **Long-Range Laser Distance Sensors**: 1,500 mm
- **Energetic Reflex Sensors**: 700 mm
- **Reflex Sensors with Background Suppression**: 300 mm
- **Universal Retro-Reflex Sensors**: 12,000 mm
- **Retro-Reflex Sensors for Transparent Objects**: 2,000 mm
- **Through-Beam Sensors**: 10,000 mm

Upper range limit
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<thead>
<tr>
<th>Connection</th>
<th>Light source</th>
<th>Spot</th>
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<tbody>
<tr>
<td>Cable end: M12 × 1 Cable Plug: M8 × 1</td>
<td>Laser (red) class 1 Laser (infrared) class 1</td>
<td>Triple dot Dot</td>
</tr>
<tr>
<td>Plug: M8 × 1</td>
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Detailed information concerning products can be found in the technical data sheets at: [www.wenglor.com/pngsmart](http://www.wenglor.com/pngsmart)
1 Reflex Sensors with Background Suppression

Upper range limit

2 Universal Retro-Reflex Sensors

3 Retro-Reflex Sensors for Transparent Objects

4 Through-Beam Sensors

Functional Principle

Reflex Sensors with Background Suppression

Upper range limit

Universal Retro-Reflex Sensors

Upper range limit

Retro-Reflex Sensors for Transparent Objects

Upper range limit

Through-Beam Sensors

Upper range limit
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<td><strong>Cable</strong></td>
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<tr>
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Reflex Sensors with Background Suppression

Universal Retro-Reflex Sensors

Retro-Reflex Sensors for Transparent Objects

Through-Beam Sensors

Reflex Light Barriers

Long-Range Laser Distance Sensors

Upper range limit

3000 mm

1000 mm

11000 mm

2600 mm

20000 mm
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Reflex Sensors with Background Suppression

Energetic Reflex Sensors

Long-Range Laser Distance Sensors

Universal Retro-Reflex Sensors

Retro-Reflex Sensors for Transparent Objects

Through-Beam Sensors

Functional principle

Upper detection range limit

1000 mm

700 mm

200 mm

12000 mm

2000 mm

10000 mm
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